Alberta
ENVIRONMENT
SUSTAINABLE RESOURCE
DEVELOPMENT

REGIONAL SUSTAINABLE DEVELOPMENT STRATEGY

FOR THE ATHABASCA OIL SANDS AREA

PROGRESS REPORT

JULY 2001

This report is produced by Alberta Environment and Alberta Sustainable Resource Development.
For more information on this report, contact:

Mike Boyd
Alberta Environment
Northeast Boreal Branch
Twin Atria
#111, 4999 – 98 Avenue
Edmonton, AB
T6B 2X3
Phone: 780-422-2598

A copy of the Regional Sustainable Development Strategy can be found at
http://www.gov.ab.ca/env/regions/neb/rsds/

July, 2001
ISBN: 0-7785-1923-6 (Printed Edition)
ISBN: 0-7785-1924-4 (Online Edition)
Pub. No. T/633

EXECUTIVE SUMMARY

This report provides the Deputy Ministers of Alberta Environment (AENV) and Alberta Sustainable Resource Development (ASRD) with an update on the implementation of the *Regional Sustainable Development Strategy for the Athabasca Oil Sands Area* (RSDS). The July 1999 release of the RSDS outlined a framework for managing cumulative environmental effects to ensure sustainable development in the Athabasca oil sands area in northeastern Alberta, a region experiencing tremendous economic growth, and at the same time, significant environmental impacts.

The RSDS is being implemented in partnership with the Cumulative Environmental Management Association (CEMA), a regional multi-stakeholder group made up of industry, government, environmental organisations, Aboriginal groups and regional parties. CEMA is funded primarily by industry with substantial in-kind support by government, Aboriginal members, and environmental groups. The RSDS and CEMA are recognised as separate entities working toward a common goal: a consensus-based environmental management system for the Regional Municipality of Wood Buffalo. This management system will be composed of management objectives and tools, as well as monitoring systems to ensure that objectives, once in place, continue to be achieved over time.

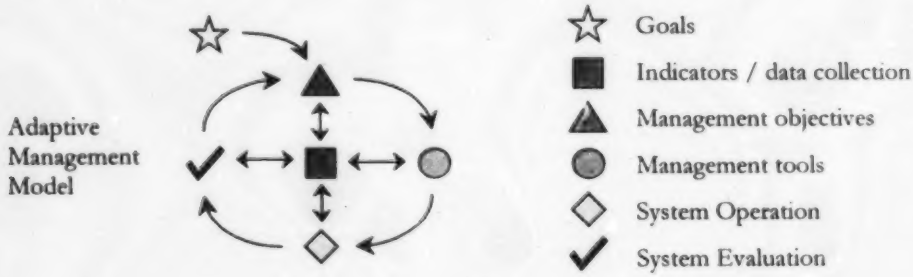
The development of an environmental management system was described in the RSDS. The strategy outlined activities and timelines for 14 different "themes" representing regional environmental issues. Work on the most pressing themes was to begin immediately, with work on the remaining themes to be initiated within a five year timeframe. It has become clear as work has progressed that the strategy's original timelines were somewhat unrealistic for 2001. This is because of the complexity of the environmental issues and the consultative, interactive nature of the partnership process. The strategy's original implementation schedule suggested interim management objectives for all "first round" themes would be prepared by July 2001. CEMA is now forecasting delivery of initial products from the fall of 2001 through 2002.

There has been much progress during the past two years. CEMA has formed five working groups and numerous subgroups. The working groups have established work plans, budgets, and funding plans, and some groups are close to setting management objectives, and expect to bring them to CEMA for approval later this year. As objectives are developed and approved, they will be published as individual product reports and will be made available to the public. A schematic diagram of the schedule for delivery of products from the CEMA working groups is presented in Figure 1.

The implementation of the RSDS still faces several challenges: maintaining the support of a diverse cross-section of stakeholders, acquiring adequate funding and human resources, and delivering high quality products in time to influence management of the current wave of development in the region. CEMA members are working hard to meet the challenges facing them and to take a proactive approach in resolving obstacles that may arise.
While CEMA's work is in progress, the provincial and federal governments will continue to use the existing regulatory system to manage development in the region. The current regulations allow for inclusion of stakeholder input into the decision-making process, and for consideration of cumulative

effects through Environmental Impact Assessments. The government will provide a regulatory backstop to ensure that the RSDS is implemented in a timely manner and is consistent with the government's mandate of environmental protection and sustainable development. The best management practices currently in use by industry on a voluntary basis will also continue to be developed and encouraged both within the CEMA working groups and through the regulatory approval process.

Working Group	2000	2001	2002	2003
Sustainable Ecosystems Working Group	☆	■●	▲	●
Wildlife & Fish Subgroup	☆	■▲	▲	●
Landscape & Biodiversity Subgroup	☆	■	▲	●
Cultural & Historical Resources Subgroup		☆■	▲	●
Trace Metals and Air Contaminants Working Group	☆	■	▲	●
NO_x/SO_2 Management Working Group	☆■	■▲	■●◇	●✓
Water Working Group	■	☆	■	▲●
Reclamation Working Group	■	☆	■	▲●



(See Section 1.4.2 for definitions of these terms)

Figure 1. At-a-glance schedule for delivery of products from the CEMA Working Groups

TABLE OF CONTENTS

1. INTRODUCTION **1**

1.1. PURPOSE OF THE RSDS 1
1.2. CREATING THE RSDS 2
1.2.1. RSDS Progression – From 72 issues to 14 themes to 3 categories *2*
1.2.2. RSDS Blueprints for Action *2*
1.2.3. Recognition of the RSDS Design *2*
1.3. RSDS IMPLEMENTATION 4
1.3.1. CEMA *4*
1.3.2. Regional Monitoring Groups *6*
1.3.3. Regulatory Teams Supporting Implementation of the RSDS *7*
1.4. REGIONAL MANAGEMENT 7
1.4.1. Current Regional Regulatory and Environmental Management Activity *7*
1.4.2. Defining Management Objectives and Management Options *9*

2. PROGRESS REPORTS **11**

2.1. HIGHLIGHTS 11
2.1.1. Progress *11*
2.1.2. Challenges *12*
2.2. CEMA WORKING GROUPS PROGRESS 13
2.2.1. NO_x/SO_2 Management Working Group *13*
2.2.2. Reclamation Working Group *15*
2.2.3. Sustainable Ecosystems Working Group *17*
2.2.3.1. Cultural and Historical Resources Subgroup *19*
2.2.3.2. Landscape and Biodiversity Subgroup *20*
2.2.3.3. Wildlife and Fish Subgroup *21*
2.2.4. Trace Metals and Air Contaminants Working Group *22*
2.2.5. Water Working Group *23*
2.3. CEMA COMMITTEES PROGRESS 24
2.3.1. Communications Committee *24*
2.3.2. Traditional Environmental Knowledge Standing Committee *25*
2.4. REGIONAL INFORMATION SYSTEM PROGRESS 26

3. SUMMARY **27**

3.1. TIMELINES FOR MANAGING CUMULATIVE ENVIRONMENTAL EFFECTS 27
3.2. SUMMARY OF WORKING GROUP / COMMITTEES PROGRESS AND CHALLENGES 28
3.2.1. Progress *28*
3.2.2. Challenges *30*

102-05731/

1. INTRODUCTION

Oil production in the Athabasca oil sands in northeast Alberta is expected to double from current levels within the next ten years, and is expected to increase up to five times today's levels by the year 2025. These predictions indicate that the region could be producing more than 50 percent of Canada's oil supply in the near future. As the unprecedented pace of oil sands development progresses, new challenges need to be addressed: managing access to public land; competition for renewable natural resources such as forests, wildlife and water; and increased potential for compounding effects on environmental quality, biological diversity, and human health.

To meet these challenges, the Alberta government (Alberta Environment, which manages air, water, soil and wastes; and the new Alberta Sustainable Resource Development, which manages forests, fish and wildlife, and public lands) committed to leading the creation and implementation of the *Regional Sustainable Development Strategy for the Athabasca Oil Sands Area* (RSDS) in conjunction with a strong partnership involving regional parties and other regulators. The RSDS was announced in September 1998, and the strategy was released in July 1999. This report describes the progress of the RSDS implementation during the past two years.

1.1. Purpose of the RSDS

The purpose of the RSDS is to provide a framework for managing cumulative environmental effects and to ensure sustainable development in the Athabasca oil sands area, which encompasses the Regional Municipality of Wood Buffalo (RMWB) (Figure 2). This area is currently experiencing unprecedented growth, and at the same time, environmental impacts. A new approach was needed to provide opportunities for more input into natural resource and environmental management in the region. The strategy was designed with the full and active participation of regional parties, providing a balance between the need to comply with the regulatory authority of government and the need to share regional stewardship of natural resources and the environment with stakeholders. This ongoing approach is expected to help resolve environmental issues in a collaborative fashion and to minimise confrontational approaches such as legal hearings and court challenges.

The RSDS is building on Alberta's current environmental and natural resource management system by creating a framework for:

- Identifying important environmental issues.
- Ensuring the environment is protected.
- Providing support for sustainable economic growth in the region that is consistent with environmental protection and natural resource sustainability.
- Collecting information to assist in making regional management decisions.
- Creating an environmental management system that will adapt to the changing needs of the area.

1.2. Creating the RSDS

1.2.1. RSDS Progression – From 72 issues to 14 themes to 3 categories

The development of the RSDS began in the fall of 1998 with the identification of 72 environmental issues of concern. These issues were identified through extensive consultations with regional stakeholders with the help of the Cumulative Environmental Effects Management Initiative (CEEMI) (now formally established as the not-for-profit Cumulative Environmental Management Association, or CEMA). The issues were grouped according to similarities, and a list of 14 themes was developed. The themes were then sorted into three categories (A, B, and C), based on urgency (a combination of timing, risk and uncertainty) and information gaps. Category A themes were considered the most urgent and lacking the most information, and category C themes were considered to be the least urgent and have the fewest information gaps, therefore needing less immediate attention.

RSDS Themes

Category A

1. Sustainable ecosystems
2. Cumulative impacts on wildlife
3. Soil and plant species diversity
4. Effects of air emissions on human health, wildlife and vegetation
5. Bioaccumulation of heavy metals

Category B

6. Access management
7. Cumulative impacts on fish habitat and populations
8. Effects of tailing pond emissions
9. Effects of acid deposition on sensitive receptors
10. Impacts on surface water quality

Category C

11. End pit lake water quality
12. Impacts on surface water quantity
13. Impacts on groundwater quantity
14. Impacts on groundwater quality

1.2.2. RSDS Blueprints for Action

The proposed deliverables and timelines for implementing the strategy are outlined in the "Blueprints for Action." The Blueprints suggest addressing the most important themes first and focussing work in three stages over a five-year period. The first stage would work on category A themes over the first three years. Much of the information gathering, research, and management evaluation completed over these first few years would likely apply to the other themes as well. It was expected that over time, the intensity of work on the category A themes would decrease as management systems are put in place. As efforts on the category A themes became less intense, work on the category B themes would start. Once the management systems for the category B themes were underway, work would begin on the category C themes. After five years, the overall success in resolving the three RSDS categories will be evaluated, and a new blueprint for action may be drafted.

1.2.3. Recognition of the RSDS Design

In the spring of 2000, the RSDS Design Team received a number of awards: the Bronze Premier's Award of Excellence, the Alberta Environment Achievement Award, and the Environmental Service Team Award of Excellence. In addition, the Design Team was a finalist for the prestigious Emerald Award, which is presented annually, recognising groups making significant environmental contributions. The RSDS Strategy Document and Technical Support Document can be downloaded from the Alberta Environment web-site at http://www.gov.ab.ca/env/regions/neb/rsds/.

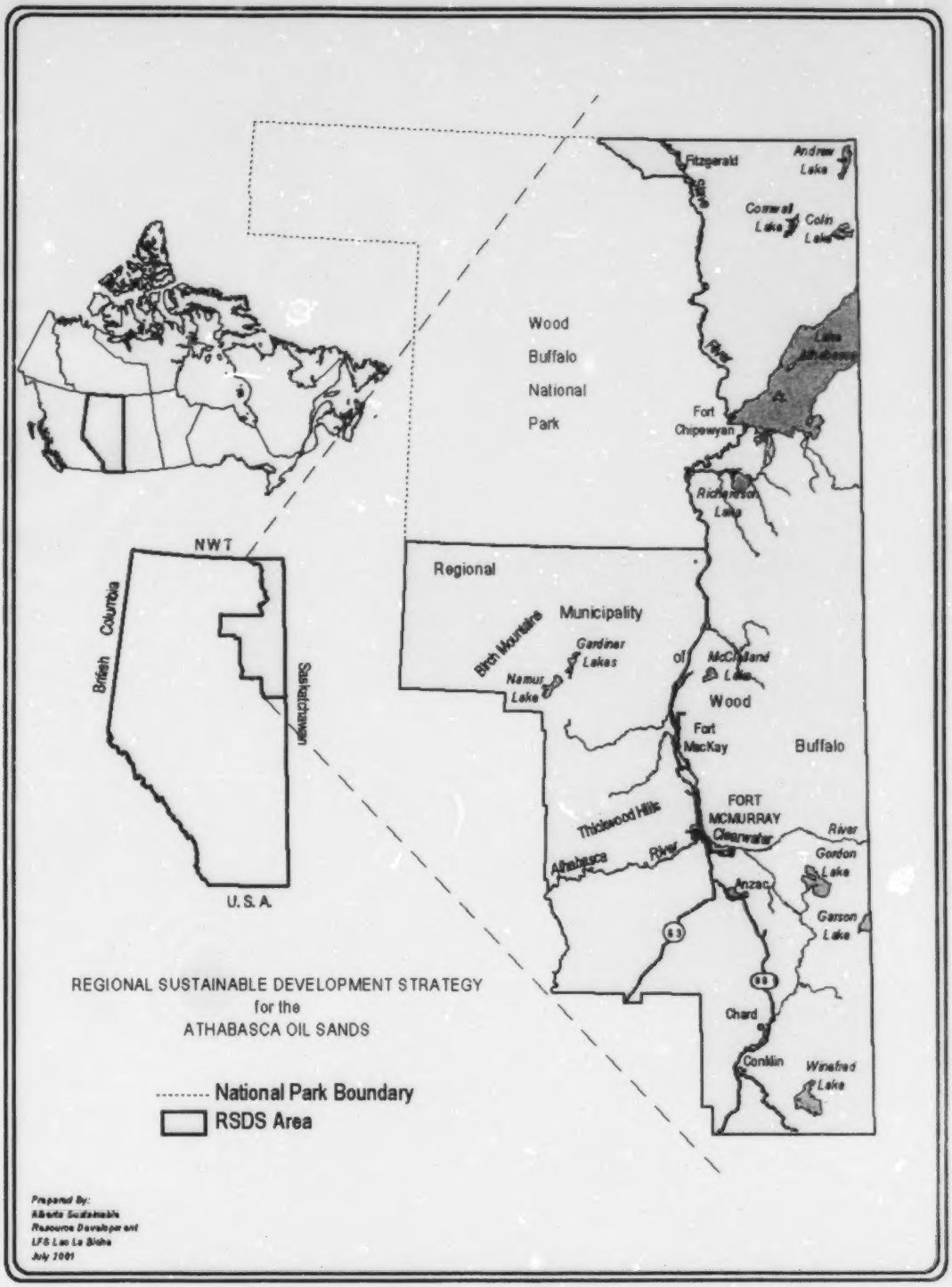


Figure 2. The RSDS Area

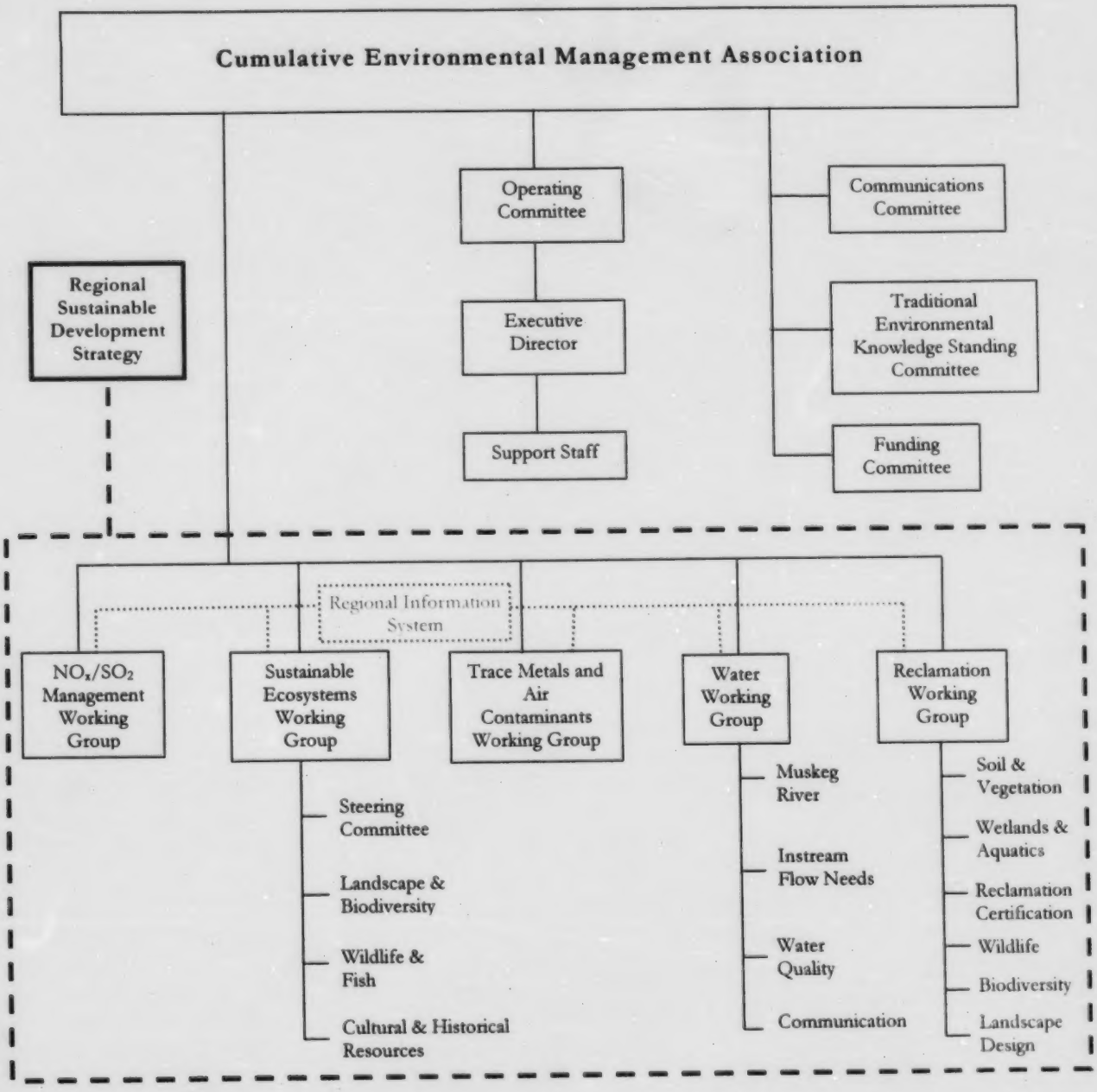


Figure 3. CEMA Organisation

1.3. RSDS Implementation

1.3.1. CEMA

The Cumulative Environmental Management Association is a multi-party group working to protect the environment in the region (Figure 3). Members include industry, government, environmental groups, and regional and Aboriginal groups. CEMA's goal is to create an effective, streamlined process for managing cumulative environmental effects, with measurable results that assess environmental protection or improvement.

CEMA is working to define environmental capacity in the region by reviewing existing data, research and traditional knowledge, and making recommendations to regulators on management objectives and management plans. CEMA is also making recommendations to industry and regulators for further monitoring or research, if required. CEMA's adaptive management approach includes ongoing review and assessment to ensure objectives are being met. CEMA is the key group working in partnership with the government to implement the RSDS.

CEMA uses consensus-based decision making, providing a forum for all members to voice concerns and make recommendations. CEMA has many technical working groups to address specific areas of environmental concern:

- NO_x/SO_2 Management Working Group – addresses issues related to acidification and ground level ozone in the region.
- Reclamation Working Group – (formerly known as the Reclamation Advisory Committee) addresses reclamation issues for all development in the region.
- Sustainable Ecosystems Working Group – addresses issues around landscape, biodiversity, cultural and historical resources, vegetation and fish and wildlife populations.
- Trace Metals and Air Contaminants Working Group – assesses the risk posed by trace metals and air contaminants to human health and ecosystems.
- Water Working Group – addresses the Muskeg River Basin watershed and the instream flow needs and water quality of the Athabasca River downstream of the oil sands operations.

Assisting the working groups is the Regional Information System (RIS). While the RIS is not a CEMA working group, it is a group organised and housed by the Alberta government to provide map-based natural resource information to the CEMA working groups. The leaders of the CEMA working groups are helping define the products required of the RIS.

In addition to these groups, CEMA has three active standing committees that provide support to the association and its working groups. The Traditional Environmental Knowledge Standing Committee is gathering environmental knowledge from Aboriginal groups in the region. The Communications Committee is developing plain language tools for publicising and discussing CEMA's activities and eventually, its recommendations, with stakeholders in the region. The Funding Committee is coordinating efforts to fund the activities of CEMA working groups and the CEMA core activities.

The overall budget for the CEMA working groups and standing committees is adjusted each year to support the work plans and products proposed by the working groups and committees. The overall CEMA budget for 2001 is approximately three million dollars.

1.3.2. Regional Monitoring Groups

The Regional Municipality of Wood Buffalo (RMWB) is home to a number of groups which monitor the regional environment. While not participating in the RSDS or CEMA, these monitoring groups have information that is directly relevant to the work being done by CEMA and its working groups.

The Wood Buffalo Environmental Association (WBEA) operates a community-driven environmental monitoring program that measures ambient air quality. There are 11 monitoring stations in WBEA's network, ranging from as far north as Fort Chipewyan and as far south as Fort McMurray. These stations continuously monitor sulphur dioxide (SO_2), oxides of nitrogen (NO_x), total hydrocarbons (THC), total reduced sulphur compounds (TRS), carbon monoxide (CO), ozone (O_3), particulate matter less than 2.5 μm ($PM_{2.5}$), and various meteorological conditions. The intermittent sampling program monitors particulate matter less than 10 μm (PM_{10}) and volatile organic compounds (VOC). The passive monitoring program monitors SO_2, NO_2, and O_3. The air quality data are compared to relevant guidelines to determine not only current air quality conditions, but also the potential for negative health and environmental effects due to exposure to ambient concentrations.

In addition to air quality, WBEA also monitors environmental effects of air emissions through the Terrestrial Environmental Effects Monitoring (TEEM) Program. The TEEM program is an industry-funded long term monitoring program focussing on terrestrial ecosystems potentially affected by emissions from oil sands mining and processing facilities. The program has been conducting monitoring studies initiated by the oil sands industry as early as 1978, and developing new programs as more is known about the potential responses of the terrestrial ecosystem to air emissions. The TEEM program monitors:

- soil acidification at permanent monitoring sites ranging in distance from 10 to 150 kilometres from the oil sands emission sources,
- trace metals in foods harvested in the region for consumption by Aboriginal communities,
- vegetation stress using false colour aerial infrared photography over the area that might show direct effects from exposure to emissions, and
- changes in response to nitrogen deposition in vegetation growth rate, nitrogen content, and community structure in nitrogen-deficient peatlands.

It is anticipated that recommendations from the various CEMA working groups will result in further expansion of the monitoring program.

The Oil Sands Regional Aquatics Monitoring Program (RAMP) is an industry-funded long term monitoring program focussing on aquatic systems potentially affected by development activities in the oil sands area. The aquatic systems of interest to RAMP are the Athabasca, Steepbank and Muskeg rivers, wetlands occurring near current and proposed oil sands developments, and acid-sensitive lakes in northeastern Alberta. Monitoring conducted to date includes surveys of water quality, sediment quality, benthic invertebrates, fish, and wetlands vegetation.

1.3.3. Regulatory Teams Supporting Implementation of the RSDS

A key component of the RSDS activity is the dual role that regulatory agencies are playing in implementing the strategy. Regulators are providing technical experts as support to the CEMA working groups as well as providing a regulatory backstop for the recommendations from the multi-party organisations through the existing regulatory review and approvals process. The regulator's role shifts back and forth from a consultation and arbitration role to that of a partner in both the design and implementation phases.

The technical support for the RSDS is coordinated by an interdepartmental team from Alberta Environment and Alberta Sustainable Resource Development. The RSDS implementation team includes the core technical support staff active in the RSDS working groups. This team coordinates technical input of government data to the CEMA working groups. It also identifies administrative and process issues to internal regional managers and provides recommendations to resolve them.

An inter-jurisdictional team, the Regional Regulators Committee, provides the policy and regulatory steering role for the RSDS. The committee has members from the federal government (Environment Canada, Department of Fisheries and Oceans), the municipal government (Regional Municipality of Wood Buffalo), and provincial departments (Alberta Environment, Alberta Sustainable Resource Development, Alberta Energy, Alberta Energy and Utilities Board, Alberta Agriculture Food and Rural Development, and the Saskatchewan Environment and Resource Management).

1.4. Regional Management

1.4.1. Current Regional Regulatory and Environmental Management Activity

The regional management objectives and activities recommended by CEMA will be reviewed and implemented by regulators through regional guidelines, information letters, operating approvals, licences, and permits issued in the region. CEMA's recommendations for regulators and industry will be in addition to the current regulatory and environmental management activities in the region. This regulatory management system can be viewed at three broad levels:

1. Project-Specific
At the smallest level is company, or project-specific, management. This includes operating approvals, permits and licences issued by regulators to individual companies. These are legally binding documents such as approvals, dispositions, and authorisations from municipal, provincial and federal governments and agencies. The specific sections of the operating approvals, permits and licenses, manage activities within the confines of the land base where the activity takes place.

2. Multi-party
Multi-party management is implemented when there is a common interest/activity in a shared resource. The level of management includes resource plans, and forest and land management plans. The process used to develop multi-party management includes substantial public input. These

activities provide direction to industries on how to best meet the goals and objectives of the region. CEMA's work would apply to this level of management.

3. Province-wide
The broadest level of environmental management encompasses province-wide activities. These include provincial policies and guidelines to protect air, water, and terrestrial resources, and to conserve cultural, historical and natural resources. These activities usually fulfil provincial commitments to national and international initiatives.

To picture these three levels of environmental management, consider the current regulatory activities associated with land management in Alberta:

Project-Specific Land Management:
Land management is regulated by several different acts of legislation. For large projects that affect navigable water or treaty lands federal legislation may apply and projects may also require licenses from municipal governments. An example of three key provincial acts that apply to land management are the *Public Lands Act*, the *Forest Act*, and the *Environmental Protection and Enhancement Act*.

- The *Public Lands Act* authorises the issuance of dispositions such as mineral surface leases that grant an individual or proponent the right to enter and occupy land for a stated purpose.
- The *Forest Act* authorises the removal of trees for commercial uses and also provides direction through the Timber Management Regulations concerning the level of mitigation and restoration required to return a forest ecosystem on lands that are harvested.
- The *Environmental Protection and Enhancement Act*, through the Conservation and Reclamation Regulation, requires that a proposed project re-establish a landscape that demonstrates equivalent land capability. This means that the reclaimed land will support various land uses similar to what existed prior to the proposed activity being conducted on the land.

Multi-Party Land Management Activity:
At the strategic level, the RSDS was considered a pilot project for the Integrated Resource Management (IRM) concept in the Northeast Boreal Region of Alberta Environment. The IRM planning and management process is also presently underway at the local (operational) level. Examples of multi-party land management activity are as follows:

- The Fort McMurray-Athabasca Subregional Integrated Resource Plan (IRP). This plan provides direction to proponents of proposed projects and is a comprehensive integrated approach for the management of public lands and resources. The IRP provides direction for opportunities for resource extraction, minimisation of impacts and reclamation strategies for the land after completion of a project.
- The Alberta Pacific Forest Industries Detailed Forest Management Plan (DFMP). The DFMP is one of the mechanisms for the application of IRM in the Green Area, and provides the direction, strategies and objectives for land and resource management in the Forest Management Agreement (FMA). The primary focus of the DFMP is to manage and mitigate the impacts of the activities caused on the land by the forest operations, but it also

considers the impacts of other activities that occur on the same land base. The DFMP has a set of objectives for many resource values such as biodiversity, impacts to wildlife habitat and populations, disturbance patterns, level of disturbance, impacts to traditional resource values, and watershed quality and quantity. The oil sands operators are working in conjunction with the DFMP to plan and implement strategies needed to restore a sustainable ecosystem on the portion of the FMA impacted by oil sands extraction.

- The Alberta Chamber of Resources Integrated Land Management Initiative (ILM). This program has a number of initiatives underway in various areas of the province to coordinate industrial land use between the oil and gas industry and the forest industry, particularly for collaborative road planning at the broad scale.

Province Wide Land Management Activities:
The Alberta Forest Legacy is a provincial policy that supports an integrated approach to managing forests in Alberta. It promotes the adaptive management approach and supports a range of management objectives and intensities. This strategy is being used by Forest Management Agreements throughout Alberta in their detailed forest management plans.

1.4.2. Defining Management Objectives and Management Options

The RSDS and CEMA working groups are developing adaptive management systems to deal with the major issues and themes. The first step in the management system is to define what stakeholders value and how they envision a sustainable environment. The working groups will recommend specific management objectives, which will be achieved by implementing management options. Long-term monitoring is a means of evaluating success in meeting the objectives. Future changes to the management systems will be recommended based on results of the monitoring. The following definitions help to clarify certain terms being used by the working groups (partially adapted from Canadian Standards Association):

Value: a principle, standard, or quality considered worthwhile or desirable.

Goal: a broad, general statement that describes a desired state or condition related to one or more values. In other words, goals are the ends to be achieved.

Indicator: a measurable variable used to report progress toward the achievement of a goal. Indicators can be selected for either the resources themselves (e.g. wildlife population, vegetation community, ambient water quality) or for the compounds or activities that create a stress on the resources (e.g. emissions, physical disturbance).

Management objective: the desired level of an indicator. This is a specific, numerical target that is selected with consideration for both environmental capacity or thresholds (based on science and traditional environmental knowledge), as well as socio-economic values and desires.

Management option: the means applied to achieve the management objectives. There are a wide variety of approaches for achieving objectives, including such options as research, monitoring, better

technology, controls on resource use, operational guidelines, a tiered management system, or amendments to existing policies and programs.

System operation: implementation of the system, or the specific mechanisms and actions needed to apply the management options.

System evaluation: the assessment of success in achieving goals and objectives (usually addressed through monitoring).

Table 1 provides examples of management objectives and options for a few issues. These are only examples used to illustrate the concept – there are many more types of indicators and management objectives that may be developed, and the numerical objectives presented do not represent real information.

Table 1: Examples of Management Objectives and Options

Issue area	Wildlife	Landscape diversity
Goal	Sustain viable and healthy populations of wildlife	Sustain the natural range of vegetation communities
Indicator	Number of individuals of species "x" within a specific area	Area of vegetation type "x" within the region
Management Objective	16 individuals per hectare in management unit "A"	5-10% of the regional area (this is within the range of natural variability through time)
Current status	15 individuals per hectare in management unit "A"	6% of the regional area
Difference between Objective and Current Status	Population of species "x" is below management objective	Meets management objective
Management Options	Enhance habitat availability, modify harvest levels, reduce habitat disturbance	Periodic assessment of extent of all vegetation types

2. PROGRESS REPORTS

2.1. Highlights

2.1.1. Progress

Two years have passed since the release of the RSDS, and CEMA members have been working hard to implement the strategy. One of the original intentions of the RSDS was to provide a forum for stakeholders in the Athabasca Oil Sands area to address cumulative effects in an ongoing manner rather than only through approvals and related regulatory hearings. Until this initiative there was no other means of ensuring that these issues were being addressed in an ongoing manner, and that proponents would have the necessary input from stakeholders on how and to what extent they should be addressed. This section highlights the progress made by the CEMA working groups. An in-depth review of each working group follows in section 2.2.

- The NO_x/SO_2 Management Working Group is mapping the sensitivity of ecological resources to acidification, has initiated field data collection, and anticipates developing management objectives for acid forming compounds (oxides of nitrogen and sulphur dioxide) by the end of this year. This group has also been designing an ozone measurement program to evaluate sources of ground-level ozone, and expects to implement this program in the summers of 2001 and 2002.
- The Reclamation Working Group recently joined CEMA, bringing with it three completed reclamation guidelines. Since becoming a CEMA member in February 2001, the Reclamation Working Group has formed six subgroups to work on a number of reclamation issues of high priority.
- The Sustainable Ecosystems Working Group (SEWG) and its three subgroups have been working on a number of tasks, including identifying values and goals, drafting a strategic approach for the development of its management system, developing a list of management tools to address fragmentation issues, and evaluating the use of various models for assessing current and future conditions. All three SEWG subgroups have selected and prioritised indicators, as well as hired consultants to compile and synthesise information.
- The Trace Metals and Air Contaminants Working Group has completed a report titled *Review and Assessment of the Deposition and Potential Bioaccumulation of Trace Metals*.
- The Water Working Group has formed four subgroups to work on watershed integrity of the Muskeg River Drainage Basin and, water quality, in-stream flow needs of the Athabasca River, and communication of surface water information.

While not a CEMA working group, the regulator-driven Regional Information System is assisting the working groups with their data needs. The Regional Information System team is in the early stages of designing a regional database to support the regional work being done by CEMA.

In addition to the CEMA working groups' endeavours, two CEMA committees have also been active in the region. The Communications Committee has been involved with communicating

regional information relevant to CEMA to interested parties with the *Sustainable Times*, a joint newsletter with Alberta Environment and Alberta Sustainable Resource Development (the newsletters can be downloaded from http://www.gov.ab.ca/env/regions/neb/rsds/), and the construction of the CEMA web site (www.cema-wbr.org). A second committee, the Traditional Environmental Knowledge Standing Committee has been considering how to incorporate regional traditional environmental knowledge into CEMA's work.

2.1.2. Challenges

Implementing the RSDS and establishing CEMA, with all of its working groups and committees, has been a huge undertaking. While work is progressing at a steady rate, some challenges have presented themselves. One challenge, common to all CEMA working groups, is related to timing and urgency. The RSDS Blueprints for Action suggested that management objectives for the category A themes would be developed within two years of the release of the RSDS document. This report marks the two-year anniversary of the RSDS and no management objectives have yet been completed. Certain CEMA working groups are close to finalising work on some management objectives, and they expect to bring these to CEMA for approval later this year. As work has progressed, it has become clear that the complexity of the environmental issues and the consultative, interactive nature of the partnership process, and work group's demand for a thorough approach make the strategy's original targets unrealistic. However, this setback is not to be seen as a failure as it has taken some time to bring together a diverse group of people into an organisation that could tackle the complex issues that it faces. Over two years, members have laid a path forward by identifying values, creating terms of references and workplans, contracting consultants, and compiling information at numerous meetings. These efforts have resulted in the completion of a large number of tasks, and have laid the initial foundation of knowledge on which to build.

Another common challenge for all working groups and committees is human resources. The effort required by the working groups is very intensive and necessitates individuals to commit their time over and above their regular work activities. Many individuals are currently involved in more than one CEMA project, in addition to their regular work. At times, this has made it challenging for CEMA work to progress as quickly as initially hoped due to difficulties in scheduling meetings that everyone can attend and in finding time to do CEMA work between meetings. Related to this is the challenge of obtaining scientific expertise from consultants for the CEMA working groups. The work in the oil sands is very specialised, and there are only a limited number of qualified and experienced consultants available to do the work. This is compounded by the increasing pace of development and large number of projects in the oil sands area that are often drawing on the same consultants.

A third important challenge is that of funding. This pressure is felt not only by all CEMA working groups, but also by the local parties. The work being done by the CEMA working groups is significant both in volume and cost. This translates into commitments of time and resources from all CEMA stakeholders, including the environmental and Aboriginal groups, as well as the participating industry and government members. In response, CEMA has implemented a policy for reimbursing environmental and Aboriginal groups. To date, the oil sands companies in the area have been the primary source of funds for CEMA and its working groups. The overall budget for CEMA for 2001

is approximately three million dollars. Each working group is required to establish a funding formula for its planned activities. The challenge for CEMA is to obtain a broad base of funding from all industrial sectors in the region in a fair and equitable manner, as well as contributions from the regulators. The regulators have been contributing to CEMA primarily in the form of in-kind support to the CEMA working groups, although the Alberta Energy and Utilities Board and the Department of Fisheries and Oceans have funded some activities. Provincial and federal staff have played key roles on many of the CEMA committees, and have made significant contributions to the initiative.

2.2. CEMA Working Groups Progress

2.2.1. NO_x/SO_2 Management Working Group

Purpose:
The objective of the NO_x/SO_2 Management Working Group is to develop a management system for oxides of nitrogen (NO_x) and sulphur dioxide (SO_2) emissions as they relate to acidification and ground level ozone. The working group was initiated in 1998 under the terms of a Memorandum of Understanding (MOU) between several industry, non-governmental organisations, and Aboriginal parties. The work set out in the MOU was originally planned to be completed by the end of 2000, with the expectation that the work would result in the development of an interim management system, and that the MOU (now addressed through CEMA) would continue to monitor, assess, and improve the operation of this system.

Main issues being addressed:
The NO_x/SO_2 Management Working Group is addressing the effects of NO_x and SO_2 emissions from oil sands operations on ecosystems (soils, vegetation, wetlands and water bodies) and focuses on the effects of acidification and on the formation and impacts of ground-level ozone.

Progress to date:
Of all CEMA working groups, this group is the furthest along in the process of developing management objectives. The group is working on acid deposition and ozone issues:

Acid Deposition:
In order to develop a management system for acid deposition, the NO_x/SO_2 Management Working Group has been proceeding in two stages: first to compile the best available scientific information on effects and deposition levels, and then to incorporate socio-economic concerns into the management objectives. The working group held a science colloquium on acid deposition in March 2000 to assemble the best available knowledge of national and international experts on the subject of acid deposition. As a result of the colloquium, the working group has proceeded to determine the sensitivity of key receptors (different soil types, wetland types, and water bodies) and to map the location of these receptors in the region. The mapping exercise is expected to be complete by fall 2001. With this information, the group will be able to initiate the process of developing management objectives, by exploring a range of development scenarios and levels of protection. The management objectives are projected to be ready by the end of 2001.

Ozone:
The Ozone Action Plan is broken into three tasks, following the approach used in the MOU for the NO_x/SO_2 Management Working Group:

1. Review/establish regional environmental capacity guidelines
2. Establish environmental management objectives
3. Establish a management system and plan

The focus of the Ozone Action Plan is on task three, "to design a management system and plan to address ground-level ozone and its effects on both vegetation and health." There are two main reasons for this focus:

- First, there has been a tremendous effort by other research groups throughout the world on defining the effects of ozone on vegetation and on health (and hence establishing the environmental capacity of resources to ozone concentrations) and on developing ozone guidelines for Canada and for Alberta. Rather than duplicating efforts in these areas, the working group determined that their resources could be better used elsewhere.
- Second, there is still uncertainty in understanding the sources and potential effects of ground-level ozone in the Fort McMurray area. The action plan is focussed on designing a research program to determine whether secondary production of ozone from precursor emissions is occurring at levels that could damage the environment.

Tasks completed in 2000:

- Organised an acid deposition science colloquium in March 2000.
- Designed an ozone measurement program to evaluate whether anthropogenic sources in the region are resulting in high levels of ground-level ozone.
- Compiled guidelines on ozone that protect vegetation and health, and standards for the precursor emissions i.e. NO_x and Volatile Organic Compounds.
- Reviewed recent ozone model runs prepared for the WBEA.

Tasks to be completed in 2001:

- Development of regional management objectives for NOx and SO_2 related to acid deposition.
- Mapping the sensitivity of ecological resources (i.e. lakes and ponds, peatlands and mineral soils) to acidification in the region. Initiating field programs to collect data on sensitivity of small ponds and peatlands to acidification.
- Implementation of the ozone measurement program in the summers of 2001 and 2002.
- Development of standardised protocols for source inventorying of ozone precursors, and for ambient inventory of ozone and ozone precursors.

Budget:
At the June 2001 CEMA general meeting, CEMA accepted a 2001 budget of $260,000 for acid deposition and $250,000 for ground level ozone work.

Challenges:
Although the NO_x/SO_2 Management Working Group has gathered the best available information from North American and European experts, significant scientific uncertainty still surrounds the

effects of acidic deposition and ozone on ecosystems. In addition, meeting timelines to complete projects is a challenge because of heavy workloads.

2.2.2. Reclamation Working Group

Purpose:
The purpose of the Reclamation Working Group is to ensure that reclaimed landscapes in the region will meet regulatory requirements, will satisfy the needs and values of stakeholders, and will be environmentally sustainable.

Main issues being addressed:
The Reclamation Working Group is responsible for fulfilling the second objective of RSDS theme one on sustainable ecosystems and land-use: to define the process and standards needed to return developed land to sustainable ecosystems with desired end land use values. The Sustainable Ecosystems Working Group will set the standards that define sustainable ecosystems (through the use of management objectives) with advice from the Reclamation Working Group on what standards are achievable through reclamation practices and existing technology. The Reclamation Working Group provides a forum for industry members to share reclamation planning activities and practices with other industries and stakeholder groups, and to promote a proactive and progressive integration of closure and reclamation planning for all industrial developments. Reclamation Working Group participants also influence priorities for reclamation related research through close links to the Canadian Oilsands Network for Research and Development (CONRAD).

Progress to date:
Prior to its name change to the Reclamation Working Group, the Reclamation Advisory Committee and its various technical committees did a great deal of work related to oil sands reclamation in the region. Products delivered by this working group include three manuals which provide direction on reclaiming soils, forest vegetation, and wetlands. These were adopted by the Alberta government as regulatory guidelines: *Land Capability Classification for Forest Ecosystems in the Oil Sand Region, Guidelines for Reclamation to Forest Vegetation in the Athabasca Oil Sands Region,* and *Guidelines for Wetland Establishment on Reclaimed Oil Sands Leases.*

Land Capability Classification For Forest Ecosystems in the Oil Sands Region outlines a system to help operators and regulators make environmentally effective and cost-efficient soil salvage and replacement decisions. It supports the return of equivalent capability and provides the framework for evaluating pre-disturbance and reclaimed landscapes to sustain northern boreal forest ecosystems.

Guidelines for Reclamation to Forest Vegetation in the Athabasca Oil Sands Region outlines a process for establishing commercial forests similar to vegetation in the Central Mixedwood Subregion of the Boreal Forest Natural Region. It provides the basis for achieving an equivalent capability for ecosystem establishment for forest ecosystems, and can be enhanced for end land use preferences of commercial forest, or wildlife, or both.

Guideline for Wetland Establishment on Reclaimed Oil Sands Leases provides guidelines for developing wetlands on reclaimed landscapes in the oil sands region. The guideline describes the planning and design, development and management, performance assessment, and reclamation certification which will allow for the establishment of ecologically viable wetlands in landscapes impacted by oil sands mining.

The Alberta government uses these guidelines as the authority on reclamation when reviewing oil sand projects' applications for environmental approval under the *Environmental Protection and Enhancement Act*. The guidelines were developed using the best available knowledge at the time. They will be improved through adaptive management as knowledge is gained through research, pilot-scale tests, monitoring and experience. An example of this is the work currently being done with land capability calibration sites through the Reclamation Working Group Soils and Vegetation Subgroup. Preliminary results from this study were reported in March 2001 with further work in progress. This working group recognises the need for similar manuals for lake reclamation and reclamation to wildlife habitat. In addition, there is a need to document reclamation methods to ensure plants and animals of interest to Aboriginal stakeholders can be returned following industrial disturbance.

Since becoming an official CEMA working group, the Reclamation Working Group has completed several tasks including revising their terms of reference to be consistent with CEMA policies. Other recent work by the working group includes identifying the group's role in the resolution of the 72 RSDS issues (as lead group or assisting group), and identifying reclamation tasks of high urgency and high importance for prioritising work. The Reclamation Working Group has formed six subgroups to work on working group tasks. The subgroups are: Soils and vegetation, Wetlands and aquatics, Reclamation certification, Wildlife, Biodiversity, and Landscape design.

Presently subgroups are working on drafting work plans which will be presented to CEMA for approval before starting work on the priority tasks the Reclamation Working Group has identified.

Budget:
At the June 2001 CEMA general meeting, CEMA accepted a 2001 budget of $54,200 for the Reclamation Working Group.

Challenges:
A challenge facing this working group is coordinating work with the Sustainable Ecosystems Working Group to establish mutually agreed upon mandates, responsibility for RSDS issue resolution, and a process for efficient exchange of ideas. It is important that the two groups understand what products each requires from the other and the timelines for the delivery of these products. In addition to coordinating work with the Sustainable Ecosystems Working Group, the Reclamation Working Group must also coordinate their work with other groups doing reclamation research in the region, such as CONRAD.

2.2.3. Sustainable Ecosystems Working Group

Purpose:
The purpose of the Sustainable Ecosystems Working Group is defined in their vision, mandate and goal statements:

- *Vision*: Protect, sustain and restore the resource values of the region (resource values include ecological, economic, social, cultural and landscape values).
- *Mandate*: Guide development and resource use within the region so that the cumulative impacts do not exceed the carrying capacity of the environment.
- *Process goals*: Develop an environmental management system which includes management objectives and options, system operation, and evaluation (monitoring). The management system will take into account the relationship between the environmental effects of development and resource use, and ecosystem and landscape sustainability.

In order to achieve the mandate described above, participants of this working group developed a list of values and goals. The working group has also selected measurable indicators to assess progress toward each of the goals.

Main issues being addressed:
The Sustainable Ecosystems Working Group's work is focussing on the issues from RSDS themes 1, 2, 3 and six6 including ecosystem sustainability, land use, cumulative impacts on vegetation, wildlife, biodiversity and access management. The issue of ecosystem sustainability is so broad that it also draws in other issues such as reclamation, water, and impacts of acid deposition. Through ongoing discussion with other regional working groups, the Sustainable Ecosystems Working Group has developed an understanding of their level of responsibility for various RSDS issues.

Progress to date:
Since its inception in April 2001, the Sustainable Ecosystems Working Group has held nine meetings (not including subgroup and steering committee meetings). The working group has approximately 30 participants representing all stakeholder sectors in the region. Given the many diverse issues that must be addressed, this working group has formed three subgroups: Cultural & Historical Resources, Landscape and Biodiversity, and Wildlife and Fish. These subgroups are comprised of technical experts in addition to the full range of stakeholder groups, and meet regularly. The subgroup products are brought back to the main working group for approval and integration. There are also several smaller task groups which are addressing issues on non-renewable resources, modelling, development scenarios, resource use expectations, and management tools. To date, the Sustainable Ecosystems Working Group and its subgroups have developed a strategic approach to developing the management system, as well as detailed work plans and budgets for the next two years. The main tasks common to each subgroup work plan are the following:

1. Determine the values, goals and indicators.
2. Define the baseline conditions incorporating natural variability and management units for vegetation communities, biodiversity, soils, landforms and watersheds.
3. Recommend management objectives for these resources. This is a two-step process:
   A. Establish environmental capacity guidelines (or environmental benchmark conditions for biodiversity).

B. Recommend environmental management objectives that include a protective cushion for the environmental capacity guideline.

4. Provide recommendations for regional management options (which may include research, monitoring, development of operational guidelines, and so forth).
5. Provide recommendations for management system operation and assessment.
6. Integrate recommended management objectives and options into overall recommendations for management system for an ecosystem and landscape sustainability.

A list of values and goals was developed, and the subgroups have defined a list of indicators to measure progress of the goals. The subgroups have now started gathering baseline information on the current status of the indicators, and their natural variability, where possible. Future conditions under different development scenarios will be modelled as part of the input into setting management objectives. A task group is currently evaluating different models that could potentially be used by the subgroups. The Sustainable Ecosystems Working Group is focussing initial data collection and analysis efforts on the area south of Lake Athabasca. Once this work is underway, additional work will proceed to gather data in the Canadian Shield Natural Region, north of Lake Athabasca.

The working group has recognised the need and opportunity to jump from task 1 to tasks 4 and 5 (see tasks listed above). This need arose partially in response to the length of time required to complete tasks two and three. The working group formed the Management Tools Task Group, which hired a consultant to provide recommendations on existing or emerging management tools that can be readily applied to reduce ecosystem disturbance and fragmentation in the region. There are many useful tools that can be applied right now by land and resource users, reducing the impacts of fragmentation, while the Sustainable Ecosystems Working Group continues gathering data on baseline conditions and environmental capacities. Examples of tools include integrating landscape management, constraint mapping (to avoid or minimise impacts to sensitive areas), and low-impact seismic exploration techniques.

A steering committee consisting of the chairs of the Sustainable Ecosystems Working Group and its subgroups meets regularly to facilitate progress on the work plan. A critical path analysis is being conducted to track the overall schedule and key milestones and to identify interaction points with the other working groups.

Budget:
A funding formula has been developed and signed by nine oil sands companies, who have committed to providing funding up to a total of $695,000 for the working group for 2001. This sum represents approximately 50 percent of the working group budget for 2001. The CEMA Operating Committee is working on strategies to encourage other developers to participate in the funding of this group.

Challenges:
An important challenge for the Sustainable Ecosystems Working Group is trying to understand how to assess ecosystem sustainability, build the necessary data sets (baseline, current, future possibilities), find and/or develop the necessary analytical tools, develop draft management objectives, and then have a general understanding and acceptance of them in the fastest time possible.

A second challenge facing the working group is the setback in the group's original work schedule. The group originally projected developing management objectives by July 2001. Due to the complexity of the issues, the changes in scope, and the time required to establish trust and working relationships among parties, the Sustainable Ecosystems Working Group expects to produce some of their management objectives by July 2002. The working group may be able to develop one or two objectives by the end of 2001.

SEWG Subgroups

2.2.3.1. Cultural and Historical Resources Subgroup

Purpose:
The purpose of the Cultural and Historical Resources Subgroup is to provide input and recommendations to the Sustainable Ecosystems Working Group for sustaining the cultural, historical, recreational and aesthetic resources in the oil sands region.

Main issues being addressed:
At the workshop held by the main working group on stakeholder goals and values, several specific goals were put forward by parties to protect and maintain local cultural and historical resources. Such goals include sustaining recreational opportunities and areas of natural beauty; managing access to recreational resources, water and spiritual areas; and protecting historical resources.

Progress to date:
To date, the Cultural and Historical Resources Subgroup has nine participants who have met several times since the group was formed in January 2001. The subgroup is addressing 8 Sustainable Ecosystems Working Group goals and 19 indicators selected and prioritised to measure the progress toward these goals. The Cultural and Historical Resources Subgroup is expecting to set interim management objectives for some indicators by the end of 2001. A consultant has been hired to develop and lead a workshop on visual resource management in the summer 2001.

Budget:
At the June 2001 CEMA general meeting, CEMA accepted a 2001 budget for $50,000 of the $695,000 total Sustainable Ecosystems Working Group budget, for the Cultural and Historical Resources Subgroup.

Challenges:
One of the challenges facing the Cultural and Historical Resources Subgroup is access management. This issue includes access to recreational areas, water bodies, and traditional sites, as well as balancing continued access with the need to manage sensitive wildlife populations. Another important challenge for the Cultural and Historical Resources Subgroup is the lack of Aboriginal and environmental representatives on this subgroup.

2.2.3.2. Landscape and Biodiversity Subgroup

Purpose:
The Landscape and Biodiversity Subgroup was formed under the Sustainable Ecosystems Working Group to help develop an overall environmental management system for ecosystem and landscape sustainability. The vision that guides the subgroup is to protect, sustain, and restore the landscape, biodiversity, vegetation resources, unique landscape features, ecological capabilities, soil and watershed integrity within the region.

The overall objective of the Landscape and Biodiversity Subgroup is to ensure that the cumulative impacts of development and resource use do not exceed the carrying capacity of the environment. The subgroup will work toward achieving the following goals, and will present its results in the form of recommendations:

- Guide the development and use of the land, soil and vegetation resources.
- Maintain the watershed integrity, unique landscape features and ecological capability.
- Develop regional management objectives for biodiversity at the species and community levels.
- Develop management objectives for biodiversity within management units.
- Develop a management approach to maintain biodiversity at the genetic level.
- Recommend management options, which may include research, monitoring and the development of operational guidelines.

Main issues being addressed:
Examples of issues being addressed by the Landscape and Biodiversity Subgroup include changes to watersheds, biodiversity at the species, ecosystem and landscape levels, landform continuity, use of native species for reclamation, wetlands and riparian areas, and impacts of development on forest values.

Progress to date:
In May 2000, the Landscape Subgroup and the Biodiversity Subgroup were formed under the Sustainable Ecosystems Working Group to address the issues for RSDS themes one and three, respectively. Due to the amount of overlap in the issues of interest, the two groups merged in January 2001 to form the Landscape and Biodiversity Subgroup, which has held five meetings since January. The subgroup presently has 23 participants including industry, government and Aboriginal representatives from Fort McKay, Anzac, Fort McMurray, Fort Chipewyan, and Janvier.

The subgroup has selected and prioritised a series of indicators for vegetation, biodiversity, soil, landforms, watersheds and renewable resource use. Baseline information will be collected for indicators for vegetation patterns, age classes, natural variability, and disturbance patterns. Information will also be compiled for protected areas, unique landform features, environmentally significant areas, rare and endangered plant species, plant species of social or traditional importance, and forest resource values. Certain indicators, such as soil and landform values, require further scoping before gathering data. In addition, the Landscape and Biodiversity Subgroup has hired a contractor to review and provide recommendations on the most useful biodiversity and watershed indicators. The report is expected in September 2001.

Budget:
At the June 2001 CEMA general meeting, CEMA accepted a 2001 budget for $150,000 of the $695,000 total Sustainable Ecosystems Working Group budget, for the Landscape and Biodiversity Subgroup.

Challenges:
The greatest challenge is having the quality and quantity of data necessary on which to base a sound decision. Future challenges will be to gain agreement on the management objectives, and perhaps to gain agreement on how to meet these objectives.

2.2.3.3. Wildlife and Fish Subgroup

Purpose:
The purpose of the Wildlife and Fish Subgroup of the Sustainable Ecosystems Working Group is to define an approach for developing a wildlife management strategy for the region. The strategy will provide for protection, sustainability, and, where necessary, restoration of wildlife, fish, and their habitats, during present and future levels of regional activities. The strategy will be integrated into an overall management system for ecosystem and landscape sustainability at regional and management unit levels.

The following goals have been established for the Wildlife and Fish Subgroup:

- Review the current status of wildlife and fish, and the existing management system.
- Recommend goals and objectives for wildlife and fish management.
- Improve understanding of wildlife and fish populations and responses to environmental change, and make recommendations for improving management through an adaptive management approach.

Main issues being addressed:
Issues of concern for the Wildlife and Fish Subgroup relate to the cumulative impacts of development and human use on wildlife and fish populations, and habitats in the RSDS area. Examples of issues include habitat loss and fragmentation, wildlife and fish health, traditional use, increased access, and animal harvest.

Progress to date:
The CEMA Wildlife and Fish Subgroup meets regularly, and has had eight meetings since its inception. The subgroup presently has 21 participants including industry, government and Aboriginal representatives from Fort McKay, Anzac, Fort McMurray, Fort Chipewyan, and Janvier. Many subgroup participants also sit on the Sustainable Ecosystems Working Group.

The subgroup expects to have management objective recommendations ready by September 2002 for most indicators. Recommendations for the overall environmental management system will be completed by 2003.

Proposed products:

- After identifying values, goals, species lists and selection criteria, 34 species and/or groups were selected as key indicators of the wildlife and fish resources in the region. Work on indicators will be sequenced by priorities identified by the working group.
- A consultant has been hired to review and assess existing population and habitat information in the region for some indicators. This study should be complete by September 2001.
- A consultant has been hired to review and synthesis of the existing environmental effects information for some indicators.
- A consultant has been hired to evaluate and recommend modelling tools and approaches that may be appropriate for some indicators.
- The next milestone in the work plan is to recommend management objectives. The subgroup proposes to define interim management objectives for four indicators: woodland caribou, moose, walleye and northern pike. The subgroup expects to complete these interim objectives by fall 2001. Objectives for woodland caribou will rely heavily on the expertise and broad party representation of the Boreal Caribou Committee, and its subcommittees. The Boreal Caribou Committee is close to finalising a comprehensive approach to industrial activity guidelines and caribou landscape management targets. Interim management objectives for moose, walleye and northern pike will rely heavily on the existing provincial management system regulated by Alberta Fish and Wildlife Service.

Budget:
At the June 2001 CEMA general meeting, CEMA accepted a 2001 budget for $346,000 of the $695,000 total Sustainable Ecosystems Working Group budget, for the Wildlife and Fish Subgroup.

Challenges:
Like the Landscape and Biodiversity Subgroup, the greatest challenge for the Wildlife and Fish Subgroup is having the quality and quantity of data necessary on which to base a sound decision. Future challenges will be to gain agreement on the management objectives, and perhaps to gain agreement on how to meet these objectives.

2.2.4. Trace Metals and Air Contaminants Working Group

Purpose:
The purpose of the Trace Metals and Air Contaminants Working Group is to assess the risks posed by trace metals and air contaminants to human health and ecosystems under existing environmental management systems and, if required, recommend changes to adequately manage those risks.

Main issues being addressed:
Currently, the Trace Metals and Air Contaminants Working Group is reviewing existing information on emissions, ambient concentrations, potential for deposition and exposure pathways of trace metals and air contaminants from oil sands activities in the RSDS region. This information is being compared to relevant guidelines and health/environmental benchmarks. If required, this working group will develop and implement work plans to define environmental objectives and management systems.

Progress to date:
To date, the Trace Metals and Air Contaminants Working Group has 19 participants who have met 9 times since the group formed in the spring of 2000. This group's participants include representatives of industry, Aboriginal, and non-governmental environmental sectors, as well as federal and provincial governments. The Trace Metals and Air Contaminants Working Group hired a consultant to conduct a review and assessment of the deposition and potential bioaccumulation of five trace metals in the oil sands region (aluminum, cadmium, mercury, nickel and vanadium). The report is complete, and the working group is now deciding whether further work is required for this project.

In addition to their work on trace metals, the working group has also begun work on air substances released in the oil sands region. The group has hired a consultant to determine the emission rates of regional air substances and to rank a pre-selected list of air substances according to their toxicity, bioaccumulation factors and odour thresholds. Phase two of the air substances work will involve an in-depth review of the air substances of concern.

Budget:
At the June 2001 CEMA general meeting, CEMA accepted a 2001 budget of $122,000 budget for the Trace Metals and Air Contaminants Working Group.

Challenges:
The main challenges currently facing the Trace Metals and Air Contaminants Working Group are time pressures and lack of adequate scientific information.

2.2.5. Water Working Group

Purpose:
The purpose of the Water Working Group is to:

- Establish environmental criteria and management systems to address:
  - Instream flow needs of the lower Athabasca River.
  - Watershed integrity of the Muskeg River Drainage Basin.
  - Water quality of the Athabasca River from Fort McMurray to the Peace-Athabasca Delta.
- Provide water-related information to the CEMA Communications Committee and the Athabasca Tribal Council (ATC) so they can translate it into a plain-language presentation.
- Ensure that the RSDS issues thought best undertaken by other regional initiatives can be accommodated within their programs.

Main issues being addressed:
Currently, the Water Working Group is focussing on surface water issues related to water quantity, quality, watershed sustainability issues, and communicating current knowledge on surface water issues to the public. The Water Working Group has four active subgroups: one to develop instream flow needs for the main stem of the Athabasca River, one to address the sustainability of the Muskeg River basin, one to develop a regional water quality management system for the lower

Athabasca River, and one to communicate surface water information in plain language. The four subgroups are in various stages of implementing workplans.

Progress to date:
To date, the Water Working Group has over 25 full-time participants who have met 6 times since forming in the spring of 2000. This group's participants include the industry, Aboriginal, and non-governmental environmental sectors, as well as federal and provincial governments. The working group contracted a consulting firm to conduct a preliminary review and assessment of the over-wintering of fish in the Athabasca River. This is intended to be the first stage of a multi-year program to develop an instream flow need objective for the Athabasca River. The group is currently working with the ATC to develop a plain language interpretation of the available information on surface water and fish, by compiling the available surface water and fish information. The Water Working Group has sent out a request for proposals for this task.

Budget:
At the June 2001 CEMA general meeting, CEMA accepted a 2001 budget of $414,000 for the Water Working Group.

Challenges:
In addition to funding pressures and time constraints for participants, managing water allocation and water quality may become a challenge as more projects request to withdraw water from the Athabasca River.

2.3. CEMA Committees Progress

While the establishment of the Communications Committee and the Traditional Environmental Knowledge Standing Committee was not associated with any particular RSDS theme, these committees were integrated into the report because communication and support for traditional lifestyles are included in the focus of the RSDS. CEMA formed these two committees because effective communication and the integration of traditional environmental knowledge into management systems are both important issues within CEMA that will pertain to all the working groups.

2.3.1. Communications Committee

Purpose:
The committee's mandate is to provide proactive communication planning, advice and assistance to CEMA's executives and committees and working groups. The committee's goal is to build awareness, understanding, and support for CEMA's role and goals among key audiences.

Main issues being addressed:
The committee is currently working on increasing the community's awareness of CEMA and its purpose. This will be done, for example, with brochures, a logo, a web site, newsletters, news releases, and annual reports.

Progress to date:
The Communications Committee currently acts as an editorial board for Alberta Environment's *Sustainable Times*, a regular newsletter updating readers on regional information relevant to RSDS and CEMA. The committee also designed and approved a CEMA communications plan that outlines support functions for news releases, future presentation materials, web site development, brochures and other products. The committee is continuing work on a CEMA logo design. Presentations about the organisation and its work have been made to government groups and regional stakeholders.

Challenges:
Currently the main challenges facing the Communications Committee is building local awareness of CEMA. As the working groups develop management objectives, this task may become less of a challenge. Future challenges anticipated by the Communications Committee will be consulting management plans and recommendations for thresholds with key audiences.

2.3.2. Traditional Environmental Knowledge Standing Committee

Purpose:
The purpose of the Traditional Environmental Knowledge Standing Committee is to guide the efforts of the CEMA working groups to integrate and use traditional knowledge to help ensure that the environment will be protected, sustained, and restored over the long term. This will be done by coordinating a collaborative study, assessment, and communication strategy of traditional environmental knowledge (TEK).

Main issues being addressed:
The Traditional Environmental Knowledge Standing Committee is in the early stages of defining TEK and understanding how TEK will be used within the Regional Municipality of Wood Buffalo and integrated with western science. At the same time, the standing committee is deciding how TEK will be collected, assessed, and communicated effectively.

Progress to date:
To date, the Standing Committee has appointed a chair, established a terms of reference, participated in a TEK workshop for CEMA and Reclamation Working Group representatives, and reviewed proposals for a regional TEK project.

Challenges:
The main challenge facing the Standing Committee is that of creating an understanding among non-native participants in CEMA about what TEK is and is not. It is more than a data collection process. Rather, it is a way of preserving and strengthening culture for the benefit of all stakeholders, and sharing the knowledge of traditional ways with non-native groups so that they can be used in environmental management. Due to the nature of knowledge sharing and community and cultural dynamics, the Standing Committee is also facing time and funding pressures.

2.4. Regional Information System Progress

Purpose:
While not a CEMA working group, the government-initiated Regional Information System is assisting the working groups with their data needs. The purpose of the Regional Information System is to support the CEMA working groups by providing map-based natural resource information. The product can be simple (provision of raw data) or complex (provision of analysed data).

Main issues being addressed:
The Regional Information System is in the early stages of designing a regional database. In order to understand what is needed for the database, Regional Information System participants are meeting with CEMA working groups to better understand their data needs, and comparing their requirements to the data sources that exist.

Progress:

- Some stakeholders have met to discuss the Regional Information System and to address data needs, and identified a preliminary list of data sets.
- A project manager has been assigned to the Regional Information System to coordinate development of the Regional Information Systems structure, work plans, and terms of reference. The project manager is meeting with working group leaders to define their data requirements.
- A data owner's kick-off meeting with representatives from oil sands companies, a Forest Management Agreement holder, Environment Canada, the Alberta Energy and Utilities Board, Alberta Environment (AENV) and Alberta Sustainable Resource Development (ASRD) staff was held in March 2001.
- Preparation of a terms of reference for data owners is being completed. Collection and consolidation of data will be addressed as soon as data sharing issues are resolved.
- RIS products include value-added spatial data, hard copy maps and analysis products. These products will be prepared for each working group, as required. ASRD/AENV will be the custodians of the data provided by the governments, industry and other groups.

Challenges:
The main challenge impacting the Regional Information System and all users is that much of the data is not public domain. As a result, issues currently being considered are:

- Copyright and ownership
- Ecologically sensitive data
- Aboriginal traditional and archaeological data

In addition, operational issues include:

- Integrating data with varying technical standards and platforms
- Resources needs - Resources are required to provide support for collecting, converting and distributing data, and for analysis support

3. SUMMARY

Implementation of the RSDS is a partnership between regulators and CEMA. Relationships and trust are being built between the parties in the process of working on the RSDS and CEMA. Participants from diverse backgrounds have been working together, laying the foundation for establishing environmental management systems dealing with issues important to local communities.

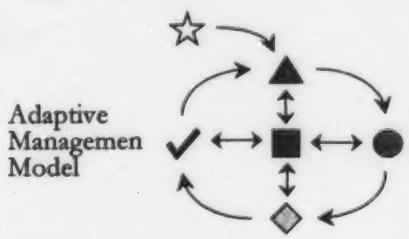
3.1. Timelines for Managing Cumulative Environmental Effects

The ultimate product RSDS will deliver through CEMA and its working groups is a management system for sustainable development, and more importantly, environmental protection. This system will be composed of management objectives, tools to achieve the objectives, and in some cases, a monitoring system to ensure that the objectives, once in place, continue to be achieved over time.

The RSDS document, issued in 1999, outlined 14 themes under the "Blueprints for Action," according to the various environmental issues identified by stakeholders. Work on the most pressing themes was to begin immediately, with work on the remaining themes to be initiated at a later date. Two years have passed since the release of the RSDS document, and the original timelines proposed in the RSDS Blueprints for Action have not been met, but there has been much progress – working groups have been formed under CEMA for all "first-round" themes, with each group having established work plans, budgets and funding plans. All of these groups have made considerable progress in the early phases of their work, and are working hard to deliver management objectives in a timely manner. Certain CEMA working groups are close to finalising work on some management objectives, and expect to bring these to CEMA for approval later this year. It will take some time for all of the management objectives to be put in place, and new work will begin as other work is completed. As objectives are developed, they will be published as individual product reports and will be made available to the public. A schematic diagram of the schedule for delivery of products from the CEMA working groups is presented in Figure 4.

While the CEMA work is in progress, the provincial and federal governments will continue to use the existing regulatory system that has been in effect for many years. They will act as regulatory backstops to ensure that implementation of the RSDS is done in a timely manner and is consistent with the government's mandate of environmental protection and sustainable development. The best management practices currently in use by industry on a voluntary basis will also continue to be developed and encouraged both within the CEMA working groups and through the regulatory approval process.

Working	2000	2001	2002	2003
Sustainable Ecosystems Working Group	☆	■●	▲	●
Wildlife & Fish	☆	■▲	▲	●
Landscape & Biodiversity	☆	■	▲	●
Cultural & Historical Resources		☆■	▲	●
Trace Metals and Air Contaminants Working	☆	■	▲	●
NO/SO Management Working Group	☆■	■▲	■●◆	●✓
Water Working Group	■	☆	■	▲●
Reclamation Working Group	■	☆	■	▲●



☆ Goals
■ Indicators / data
▲ Management
● Management
◆ System
✓ System

(See section 1.4.2 for definitions of these terms)

Figure 4. At-a-glance schedule for delivery of products from the CEMA Working Groups

3.2. Summary of Working Group / Committees Progress and Challenges

3.2.1. Progress

NO_x/SO_2 Management Working Group:

- Mapping the sensitivity of ecological resources to acidification.
- Initiated field programs to collect data on sensitivity of small ponds and peatlands to acidification.
- Designed an ozone measurement program to evaluate whether anthropogenic sources in the region are resulting in high levels of ground-level ozone.
- Compiled guidelines on ozone that protect vegetation and health, and standards for the precursor emissions (NO_x and Volatile Organic Compounds).
- Reviewed recent ozone model runs prepared for the WBEA.

Reclamation Working Group:

- Recently adopted as an official CEMA working group, changing their name from Reclamation Advisory Committee (RAC).
- Continuing calibration studies and collection of data to verify three reclamation guidelines established through the work of RAC subcommittees: *Land Capability Classification for Forest Ecosystems in the Oil Sand Region, Guidelines for Reclamation to Forest Vegetation in the Athabasca Oil Sands Region,* and *Guideline for Wetland Establishment on Reclaimed Oil Sands Leases.*
- Revised terms of reference to be consistent with CEMA policies.
- Ranked relevant issues according to urgency.
- Formed subgroups to begin work on issues of high priority.

Sustainable Ecosystems Working Group:

- Developed a strategic approach to develop the management system.
- Prepared detailed work plans and budgets for the next two years.
- Developing a list of management tools to address ecosystem disturbance and fragmentation issues.
- Defining future development scenarios.
- Tracking key milestones, tasks and interactions with other groups through a critical path analysis.
- Evaluating the use of various models for assessing current and future conditions.

Cultural and Historical Resources Subgroup:

- Selected and prioritised indicators to measure progress toward the goals.
- Hired a consultant to develop and lead a workshop on visual resource management.

Landscape and Biodiversity Subgroup:

- Selected and prioritised indicators.
- Hired a consultant to review biodiversity and watershed indicators, and to provide expert advice and recommendations.
- Issuing a contract to enhance the Alberta Ground Cover Classification System so that the vegetation information includes origin (stand age).
- Evaluating the possibility of analysing the natural disturbance pattern from historical data.

Wildlife and Fish Subgroup:

- Selected and prioritised indicators.
- Hired a consultant to review and assess existing populations and regional habitat information for certain indicators.
- Hired a consultant to review and evaluate predictive modelling tools and approaches for some indicators.
- Issuing a contract to review the relationship between disturbance and changes to populations of some indicators.

Trace Metals and Air Contaminants Working Group:

- Completed a report on trace metals: *Review and Assessment of the Deposition and Potential Bioaccumulation of Trace Metals.*
- Hired a consultant to determine the emission rates of air substances in the oil sands region and to rank a pre-selected list of air substances according to their toxicity, bioaccumulation factors and odour thresholds.

Water Working Group:

- Hired a consultant to conduct a preliminary review and assessment of the over-wintering of fish in the Athabasca River.
- Organised a workshop on the Cumulative Effects Assessment in the Muskeg Watershed.
- Issued a request for proposals to compile existing aquatics information.

Communications Committee:

- Registered domain name for CEMA web site.
- Designed and approved a CEMA communications plan that outlines support functions for news releases, future presentation materials, web site development, brochures and other products.

Traditional Environmental Knowledge Standing Committee:

- Participated in a TEK workshop for CEMA and RWG representatives.
- Reviewed proposals for a regional TEK project.

Regional Information System

- Identified a preliminary list of data sets.
- RIS project manager is meeting with working group leaders to define their data requirements.
- Prepared terms of reference for the data owners. Data will be collected and consolidated as soon as data sharing issues are resolved.

3.2.2. Challenges

NO_x/SO_2 Management Working Group:

- Scientific uncertainty still surrounds the effects of acidic deposition and ozone on ecosystems
- Time pressures for participants

Reclamation Working Group:

- Need a clear understanding of how the Reclamation Working Group's and the Sustainable Ecosystems Working Group's mandates are related, what products each group will require from the other, and the timelines for product delivery.
- Coordinating work with other groups doing reclamation work in the region

Sustainable Ecosystems Working Group:

- Understanding how to assess ecosystem sustainability, build the necessary data sets, find and/or develop the necessary analytical tools, develop draft management objectives and then have a general understanding and acceptance of them in the fastest time possible.
- Time pressures for participants
- Funding pressures

Cultural and Historical Resources Subgroup:

- Access management
- Lack of Aboriginal and environmental representatives

Landscape and Biodiversity Subgroup:

- Having the quality and quantity of data necessary on which to base a sound decision.
- Gaining agreement on the management objectives
- Gaining agreement on how to meet the management objectives.

Wildlife and Fish Subgroup:

- Having the quality and quantity of data necessary on which to base a sound decision.
- Gaining agreement on the management objectives
- Gaining agreement on how to meet the management objectives.

Trace Metals and Air Contaminants Working Group:

- Time pressures for participants
- Lack of adequate scientific information
- Agreement on how to best manage emissions of trace metal and air contaminates on a regional basis

Water Working Group:

- Funding pressures
- Time pressures for participants
- Water allocation
- Regional management of water quality

Communications Committee:

- Building grassroots awareness and recognition in the region with CEMA still being in the scientific review and assessment stage.
- Delivering management plans and recommendations for thresholds to key audiences.

Traditional Environmental Knowledge:

- Convey the purpose of incorporating TEK
- Integrating TEK into the CEMA process
- Time pressures for participants
- Funding pressures

Regional Information System:

- Time pressures for participants
- Resource constraints - need additional resources to provide support for collecting, converting and distributing data, and for data analysis.
- Data which is not public domain
- Data with varying technical standards and platforms

Appendix I

RSDS and CEMA Contacts

RSDS Implementation Team
Randall Barrett, AENV
Richard Chabaylo, ASRD
Livio Fent, ASRD
Chris Hale, ASRD
John Martin, ASRD
Jose Michel, AENV
Larry Rhude, ASRD
Tim Polzin, ASRD
Lisa Sadownik, AENV
Monique Zaloum, AENV
Lisa Zaplachinski, AENV

RSDS Management Team
Mike Boyd, AENV
Pat Marriott, AENV
Kem Singh, AENV
Doug Slatnik, ASRD
Noel St. Jean, ASRD

Regional Board of Directors
Jay Nagendran, AENV
Dennis Giggs, ASRD
Neil Barker, ASRD

Regional Regulators Committee
Neil Barker, ASRD
Peter Blackall, EC
Mike Boyd, AENV
Roger Creasey, AEUB
Kevin Crockett, AED
Gerry Dube, ASRD
Dennis Giggs, ASRD
Terry Hanley, SERM
Bonnie McInnis, RMWB
Kevin McLeod, AHW
Jay Nagendran, AENV
Dave Perraton, ACD
Paul Short, ASRD
Dan Smith, ASRD
Rhonda Wehrhahn, AE

CEMA
Ken Weagle, CEMA Executive Director

CEMA Operating Committee
Don Klym, Suncor (CEMA President)
Dan Smith, OSEC (CEMA Vice-President)
Mike Boyd, AENV
Ryerson Christie, CEAA
Ruth Kleinbub, Fort McMurray Field Naturalists
Dennis Kohlman, Petro-Canada
Alcide Punko, Fort McMurray Metis

Continue next page...

CEMA Working Group, Subgroup and Committee Leaders

NO_x/SO_2 Management Working Group:
Kim Eastlick, AEUB
Tom Marr-Laing, Pembina Institute
Judith Smith, Albian Sands

Reclamation Working Group:
Mike Boyd, AENV
Noreen Easterbrook, Albian Sands
Bruce Friesen, Syncrude

Sustainable Ecosystems Working Group (SEWG):
Judith Smith, Albian Sands
Gail MacCrimmon, Pembina Institute

SEWG Cultural and Historical Resources Subgroup:
Chris Hale, ASRD

SEWG Landscape & Biodiversity Subgroup:
Noel St. Jean, ASRD
Monique Zaloum, AENV

SEWG Wildlife & Fish Subgroup:
Richard Chabaylo, ASRD
Dennis Kohlman, Petro-Canada

Trace Metals and Air Contaminants Working Group:
Ron Pauls, Syncrude

Water Working Group:
Peter Hunt, AEUB
Bev Ross, DFO

Communications Committee:
Brenda Erskine, Suncor

Traditional Environmental Knowledge Standing Committee:
Robert Grandjambe, Mikisew Cree First Nation

ACD – Alberta Community Development
AE – Alberta Energy
AED – Alberta Economic Development
AENV – Alberta Environment
AEUB – Alberta Energy and Utilities Board
AHW – Alberta Health and Wellness
ASRD – Alberta Sustainable Resource Development
CEAA – Canadian Environmental Assessment Agency
CEMA – Cumulative Environmental Management Association
DFO – Department of Fisheries and Oceans
EC – Environment Canada
OSEC – Oil Sands Environmental Coalition
RMWB – Regional Municipality of Wood Buffalo
SERM – Saskatchewan Environment and Resource Management